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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/759,611 | 01/16/2004 | Johann Karner | H60-107 DIV | 8162 |

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| EXAMINER | |
|---|---|
| LUND, JEFFRIE ROBERT | |
| **ART UNIT** | **PAPER NUMBER** |
| 1763 | |

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE |
|---|---|---|
| 3 MONTHS | 02/27/2007 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/759,611 | KARNER ET AL. | |
| | Examiner | Art Unit | |
| | Jeffrie R. Lund | 1763 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *06 December 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 November 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☒ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okamoto, US Patent 6,017,396 in view of Karner et al, US Patent 5,753,045.

Okamoto teaches a vacuum processing apparatus that includes: two plasma discharge configurations 11, 12 that form two plasma beams 16 having discharge axis parallel to each other and in a low-voltage high-current plasma beam discharge gap between a cathode 11 and anode 12; a deposition configuration 14 holding two substrates 15, (substrate 15 is a continuous planar powder capture surface) which extend a selected distance from the beam axis along a substantial section of the

discharge beam longitudinal direction and disposed between the discharge axes; a power supply 7 to independently drive each gap; a gas suction configuration (not shown); and a gas supply section 17, 18 for supplying a silicon containing gas parallel to the discharge axis. (Figure 4 and 6)

Okamoto differs from the present invention in that Okamoto does not teach that the discharge axis A is substantially longer than any diameter of said discharge generation areas, or that the cathode is a hot cathode.

Karner et al teaches a hot cathode plasma beam discharge configuration that has a discharge axis A that is substantially longer than any diameter of said discharge generation area. (Entire document, specifically, figures 1, 3, and 3a)

The motivation for replacing the cold cathode plasma beam discharge configuration of Okamoto with the hot cathode plasma beam discharge configuration of Karner et al is to provide an alternate and equivalent plasma discharge configuration, and enable the apparatus to deposit metastable layers as taught by Karner et al.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the plasma discharge configuration of Okamoto with the plasma discharge configuration of Karner et al.

4. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Okamoto and Karner et al as applied to claims 1-8 above, and further in view of David, US Patent 6,015,597.

Okamoto and Karner et al were discussed above and teach a deposition configuration that has a continuous planar surface (i.e. flat substrate) which functions as

a powder capture surface.

Okamoto and Karner et al differ from the present invention in that they do not specifically teach that the deposition configuration is configured as a powder capture surface.

David teaches a deposition configuration configured as a powder capture surface 7. (Figure 1)

The motivation for replacing the deposition configuration of Okamoto and Karner et al with the deposition configuration of David is to enable the apparatus of Okamoto and Karner et al to produce powder products as taught by David.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the deposition configuration of Okamoto and Karner et al with the deposition configuration of David.

5. Claims 9-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ikegaya, EP 0 493 609 A1, in view of Karner et al, US Patent 5,753,045, and Matsumoto et al, US Patent 5,340,621.

Ikegaya teaches a vacuum processing apparatus that includes: a hot plasma discharge configuration 10 located between two planar deposition configurations 7 (substrates 7 are a continuous planar powder capture surface) which extend a selected distance from a plasma discharge configuration; a gas suction configuration 3; and a gas supply section 4 for supplying a gas containing carbon, nitrogen, or hydrogen gas. (Figure 1)

Ikegaya differs from the present invention in that Ikegaya does not teach that: the

plasma discharge configuration comprises two or more plasma beams with a substantially parallel discharge axes in a low-voltage high-current plasma beam discharge gap between a cathode and anode; the discharge axis (A) is substantially longer than any diameter of said discharge generation areas a gas supply configuration with a gas flow generally parallel to the plasma discharge axis; that the gas flow through the chamber is parallel to the discharge axis; or that the cathode is a cold cathode.

Karner et al teaches the a plasma processing apparatus that has a gas flow parallel to the discharge beam 1 axis A in a low-voltage high-current plasma beam discharge gap between a cathode 12 and anode 20 and connected to a power source 22. The discharge axis is disposed between multiple deposition configurations mounted on boat 24 and facing each other, and the discharge axis A is substantially longer than any diameter of said discharge generation areas (Entire document, specifically, figures 1, 3, and 3a) Karner et al also teaches that the gas flow parallel with the discharge beam axis produces more uniform coatings on larger deposition configurations by placing the deposition configurations parallel to the beam axis at a specific spacing for a desired plasma density such that the parallel gas flow produces a constant product (column 1 line 62 through column 2 line 27).

Matsumoto et al teaches two plasma beam discharge configuration with a low-voltage high-current plasma beam discharge gap between a cathode 2 (hot or cold) and anode 6 that form two plasma beams 7 parallel to each other, a power supply 16 to independently drive each gap, and a gas supply section 26, 27 for supplying a silicon containing gas. (Entire document)

The motivation for replacing the plasma discharge configuration of Ikegaya with the plasma discharge configuration of Karner et al is to provide an alternate and equivalent means of forming a plasma in the apparatus of Ikegaya.

The motivation for using multiple plasma discharge configurations to form multiple plasma beams in the apparatus of Ikegaya is to more uniformly distribute the plasma over the substrate as taught by Matsumoto et al. Furthermore, it has been held that the duplication of parts is obvious (see In re Harza 124 USPQ 378).

The motivation for making the cathode of Ikegaya a cold cathode is to provide an alternate and equivalent type of cathode, and to prevent contamination introduced by the sputtering effect of a hot cathode.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the plasma discharge configuration of Ikegaya with the plasma discharge configuration of Karner et al and use multiple plasma discharge configurations as taught by Matsumoto, and use a cold cathode as taught by Matsumoto.

6. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ikegaya, Karner et al, and Matsumoto et al as applied to claims 1-8 above, and further in view of David, US Patent 6,015,597.

Ikegaya, Karner et al, and Matsumoto et al were discussed above and teach a deposition configuration that has a continuous planar surface (i.e. flat substrate) which functions as a powder capture surface.

Ikegaya, Karner et al, and Matsumoto et al differ from the present invention in

that they do not specifically teach that the deposition configuration is configured as a powder capture surface.

David teaches a deposition configuration configured as a powder capture surface 7. (Figure 1)

The motivation for replacing the deposition configuration of Ikegaya, Karner et al, and Matsumoto et al with the deposition configuration of David is to enable the apparatus of Ikegaya, Karner et al, and Matsumoto et al to produce powder products as taught by David.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace the deposition configuration of Ikegaya, Karner et al, and Matsumoto et al with the deposition configuration of David.

***Response to Arguments***

7. Applicant's arguments with respect to claims 1-8 have been considered but are moot in view of the new ground of rejection. The rejection has been modified to replace the discharge configuration of Okamoto et al with the discharge configuration of Karner et al. It is noted by the Applicant strongly disagrees with the above combination, but the Applicant has provided no arguments why this combination is not obvious.

8. Applicant's arguments filed December 6, 2006 have been fully considered but they are not persuasive.

In regard to the argument that "Ikegaya has nothing at all to do with generating plasma beams and, accordingly, Ikegaya is not relevant but is non-analogous art", the Examiner disagrees. Ikegaya clearly teaches in column 5 line 38 through column 6 line

30, that the thermoelectron radiation material is used to generate a plasma beam. It should be noted that the "hot cathode 5" discussed by the Applicant in the specification and drawings is a thermoelectron radiation material used to form a plasma in the same manner as Ikegaya.

In regard to the argument:

> In considering whether the person of ordinary skill in the art would combine Karner with Matsumoto as suggested by the Examiner, please note that Matsumoto teaches a plasma discharge configuration that produces "a thin plane shaped, sheet like plasma" (Matsumoto at col. 6, lines 9-1 1). The sheet plasma spreads out in a plane parallel to the substrate (Matsumoto at col. 6, lines 9-11), and covers practically the entire substrate surface (Matsumoto at Fig. 4). In contrast, the plasma employed in the present invention is formed about, and extends longitudinally along, at least two substantially parallel beam axes (A), and is clearly defined by the plasma discharge configuration that generates the plasma.

the Examiner agrees. However, Matsumoto et al is used only to teach a plasma configuration with a multiple plasma beam discharge configuration, and the alternate use of a hot or cold cathode. Therefore, the arguments are moot.

In regard to the arguments directed to Karner et al, the Examiner disagrees. The rejection is based on replacing the plasma discharge configuration of Ikegaya with the plasma discharge configuration of Karner et al. Furthermore, because of the complexity of designing a PECVD system (as noted by Applicant), it would be obvious when replacing the discharge configuration of Ikegaya with the plasma discharge configuration of Karner et al to supply the gas as taught by Karner et al (i.e. parallel to the discharge axis) to maintain all of the design factors required for the proper operation of Karner et al.

***Conclusion***

9. Applicant's amendment necessitated the new ground(s) of rejection presented in

this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

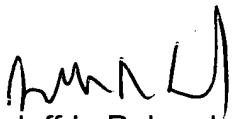
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrie R. Lund whose telephone number is (571) 272-1437. The examiner can normally be reached on Monday-Thursday (6:30 am-6:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jeffrie R. Lund
Primary Examiner
Art Unit 1763

JRL
2/20/07